# COLD WEATHER INJURY PREVENTION IN AFGHANISTAN

**Presenter's Name**
**Presenter's Command**
**Local Contact Information**

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**http://chppm-www.apgea.army.mil**
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# Introduction

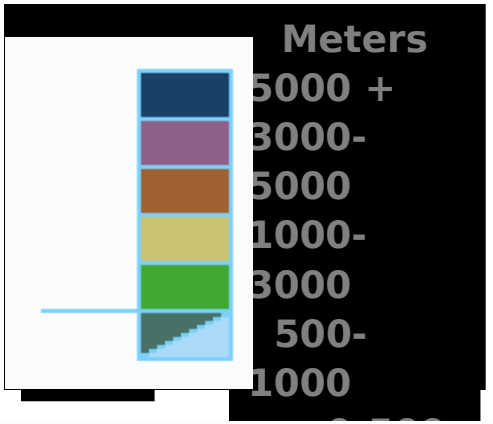
Prevention of cold injuries is a Command and Individual Responsibility

ALL COLD WEATHER INJURIES ARE PREVENTABLE!!!

# Outline

- Introduction
- Winter in Afghanistan
- Susceptibility Factors for Cold Weather Injuries
- Cold Weather Injuries
  - description
  - treatment
  - Prevention
- Cold Weather Injury Prevention
- Conclusion

# Afghanistan

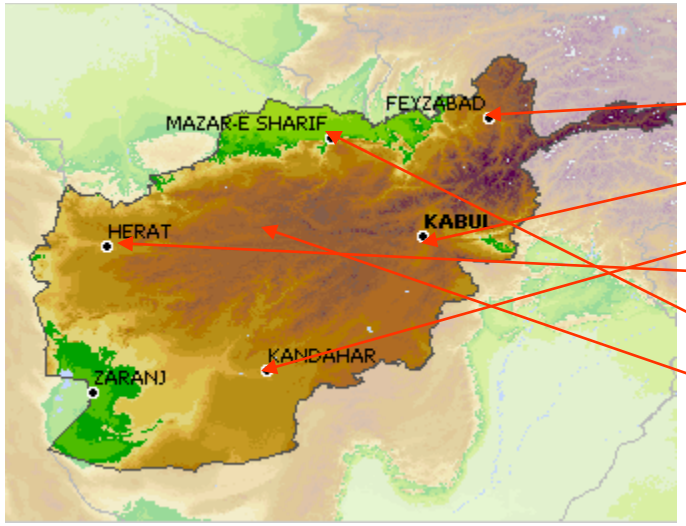


# Winters in Afghanistan

- Winter season from October – March
- Rainy season
- Winter is cold
- Temperatures more extreme in the West.
- The higher the elevation, the more snow.
- Flooding of rivers possible.

# Winters in Afghanistan

## Annual Temperature ranges (F°)




| REGION | WINTER | | |
|---|---|---|---|
| | MIN | MAX | MIN |
| Feyzabad | 28° | 70° | 28° |
| Kabul | 23° | 69° | -8° |
| Kandahar | 32° | 83° | 10° |
| Herat | 32° | 73° | -8° |
| Mazar-e-Sharif | 33° | 74° | 2° |
| Chaghcharan | 12° | 60° | -36° |

# Winters in Afghanistan

## Risks Due to Cold Weather

- Hypothermia (more likely in the mountains)
- Frostbite (more likely in the mountains)
- Chilblains
- Trench foot (most likely during flooding)
- Dehydration
- Carbon Monoxide poisoning
- Snow Blindness
- Sunburn

# Susceptibility Factors

## Typical Victim of a Cold Weather Injury

- Male
- E-4 or below
- Approximately 20 years old
- From a warm climate
- Fewer than 18 months time in service
- Uses tobacco/nicotine, alcohol or medications
- Neglects proper foot care

# Susceptibility Factors

- Previous cold weather injury
- Inadequate nutrition
- Alcohol, nicotine use
- Dehydration
- Overactivity (sweating)
- Underactivity
- Long exposure to the cold
- Sick or injured
- Ethnic/geographic origin
- Age
- Poor physical condition
- Little experience/training in cold weather
- Poor clothing and equipment

# Susceptibility Factors

- Contributing weather factors
  - Ambient temperature
  - Wind velocity
  - Wet or damp conditions
  - Altitude (low oxygen)

# Hypothermia

- Severe body heat loss-body temp falls below 95°F
- MEDICAL EMERGENCY; life threatening condition.
- Occurs when:
  - conditions are windy, clothing is wet, and/or the individual is inactive
  - extended water exposure or immersion
    - 1 hour or less when water temp is below 45°F
    - prolonged exposure in slightly cool water (e.g. 60°F)
    - thunderstorms, hail, rain and accompanying winds

# Hypothermia

The “umbles”-stumbles, mumbles, fumbles, and grumbles

- Initial Symptoms
  - shivering
  - dizzy, drowsy
  - withdrawn behavior
  - irritability
  - confusion
  - slowed, slurred speech
  - altered vision
  - stumbling
- Severe Stages
  - stops shivering
  - desire to lie down and sleep
  - heartbeat and breathing  is faint or undetectable
  - unconsciousness followed by DEATH

# Hypothermia

- Treatment
  - prevent further cold exposure
  - evacuate immediately if severe hypothermia
  - remove wet clothing
  - rewarm in dry clothing, blankets or sleeping bag
    - Place another person in a sleeping bag as an additional heat source
  - warm, sweet liquids if conscious
  - minimize handling of the unconscious victim with a low heartbeat so as to not induce a heart attack.

# Hypothermia

- Prevention
  - eat properly and often
  - warm liquids and water
  - wear uniform properly (layers worn loosely)
  - keep active
  - stay dry
  - warming tents
  - get plenty of rest
  - buddy watch/observation/NCO checks

# Hypothermia

# Frostbite

- The freezing of body tissues.
- Occurs at air temps below 32°F
  - skin freezes at 28°F
- Superficial frostbite (mild)
  - freezing of skin surface
- Deep frostbite (severe)
  - freezing of skin and flesh, may include bone
- Hands, fingers, feet, toes, ears, chin, nose, groin area

# Frostbite

- Symptoms
  - initially redness in light skin or grayish in dark skin
  - tingling, stinging sensation
  - turns numb, yellowish, waxy or gray color
  - feels cold, stiff, woody
  - blisters may develop

# Frostbite

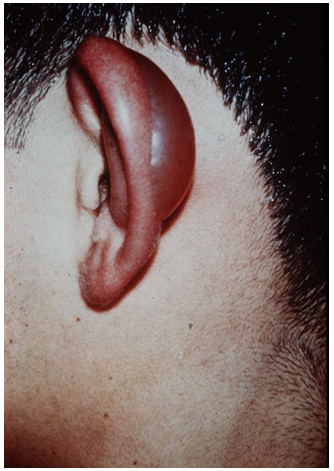
- Treatment
  - remove from cold and prevent further heat loss
  - remove constricting clothing and jewelry
  - rewarm affected area evenly with body heat until pain returns
    - when skin thaws it hurts!!
    - do not rewarm a frostbite injury if it could refreeze during evacuation or if victim must walk for medical treatment
  - do not massage affected parts or rub with snow
  - evacuate for medical treatment

# Frostbite

- Prevention
  - wear uniform properly (layers and loosely)
  - keep socks and clothing dry (use poly pro/thermax liner socks and foot powder/ change insoles also)
  - protect yourself from wind
  - keep face and ears covered and dry
  - drink hot fluids and eat often
  - keep active
  - insulate yourself from the ground (sleeping pad/tree branches etc…)
  - “Buddy System”
  - caution skin contact with super-cooled metals or fuel
  - Use approved gloves to handle fuel and POL
  - seek medical aid for all suspected cases

# Frostbite

## 2nd degree Frostbite

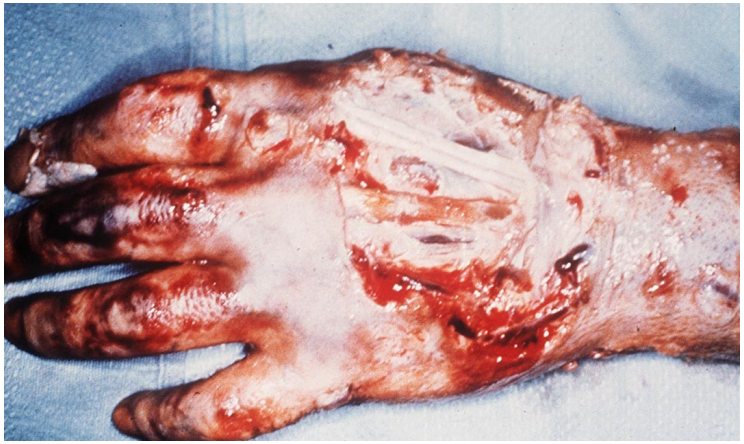


# Frostbite

## 3rd degree Frostbite

# Frostbite

## 4th degree Frostbite



# Chilblains

- Cold injury where skin is inflamed. Tissue not frozen.
- Cold, wet conditions (between 32-60°F, high humidity)
- Repeated, prolonged exposure of bare skin
- Can develop in only a few hours
- Ears, nose, cheeks, hands and feet

# Chilblains

- Symptoms:
  - initially pale and colorless
  - worsens to achy, prickly sensation then numbness
  - red, swollen, hot, itchy, tender skin upon rewarming
  - blistering in severe cases

# Chilblains

- Treatment
  - prevent further exposure
  - wash, dry gently
  - rewarm (apply body heat)
  - don’t massage or rub
  - dry sterile dressing
  - seek medical aid

# Chilblains

- Prevention
  - keep dry and warm
  - cover exposed skin
  - wear uniform properly
  - Don’t Smoke
  - use the “Buddy System”

# Chilblains

(c) University Erlangen,
Department of Dermatology
Phone: (+49) 9131 - 85 - 2727

# Trench/Immersion Foot

- Cold injury resulting from prolonged exposure to wet, cold temperatures just above freezing. (temps from 32°F-50°F)
- Tissue not frozen but it is potentially crippling.
- Prolonged exposure of skin to moisture (12 or more hours)
- High risk during wet weather, in wet areas, or sweat accumulated in boots or gloves

# Trench/Immersion Foot

- Symptoms
  - initially appears wet, soggy, white, shriveled
  - sensations of pins and needles, tingling, numbness, and then pain
  - skin discoloration - red, bluish, or black
  - becomes cold, swollen, and waxy appearance
  - may develop blisters, open weeping or bleeding
  - in extreme cases, flesh dies

# Trench/Immersion Foot

- Treatment
  - prevent further exposure
  - dry carefully
  - DO NOT break blisters, apply lotions, massage, expose to heat, or allow to walk on injury
  - rewarm by exposing to warm air
  - clean and wrap loosely
  - elevate feet to reduce swelling
  - evacuate for medical treatment

# Trench/Immersion Foot

- Prevention
  - keep feet clean and dry
  - change socks at least every 8 hours or whenever wet and apply foot powder
  - bring extra boots to field - alternate boots from day to day to allow boots to dry.
  - no blousing bands
  - report all suspected cases to leadership

# Trench/Immersion Foot

# Dehydration

- A loss of body fluids to the point of slowing or preventing normal body functions
- Increases chance of becoming a cold weather casualty (especially hypothermia)

# Dehydration

- Symptoms
  - dark urine
  - headache
  - dizziness, nausea
  - weakness
  - dry mouth, tongue, throat, lips
  - lack of appetite
  - stomach cramps or vomiting
  - irritability
  - decreased amount of urine being produced
  - mental sluggishness
  - increased or rapid heartbeat
  - lethargic
  - unconsciousness

# Dehydration

- Treatment
  - drink water or other warm liquids
  - water should be sipped, not gulped
  - do not eat snow
  - rest
  - get medical treatment

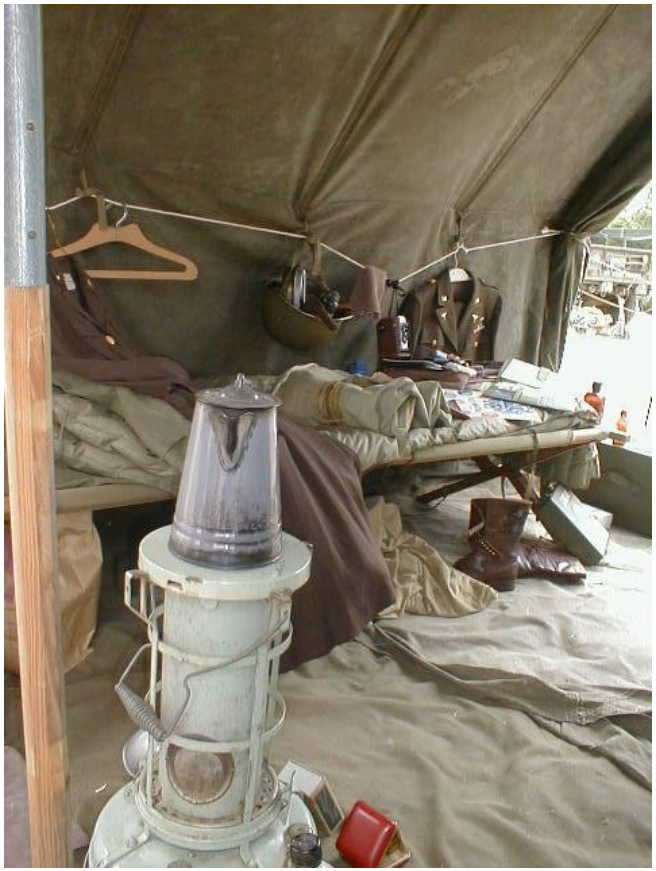
# Dehydration

- Prevention
  - drink minimum of 3-6 quarts of fluid per day
  - monitor urine color
  - do not wait until you are thirsty
  - drink hot liquids for warmth

# Carbon Monoxide Poisoning

- When oxygen in the body is replaced by carbon monoxide
  - colorless, odorless, tasteless gas resulting from incomplete combustion
- Inadequate ventilation from engines, stoves, heaters

# Carbon Monoxide Poisoning



# Carbon Monoxide Poisoning

- Symptoms
  - headache
  - dizziness
  - weakness
  - excessive yawning
  - ringing in ears
  - confusion
  - nausea
  - bright red lips, eyelids
  - grayish tint in dark-skinned people
  - drowsiness
  - unconsciousness
  - possibly death

# Carbon Monoxide Poisoning

- Treatment
  - move to fresh air immediately
  - seek medical aid promptly
  - provide mouth-to-mouth resuscitation if victim is not breathing

# Carbon Monoxide Poisoning

- Prevention
  - ensure proper ventilation
  - don’t use unvented heaters or engines
  - use only Army approved heaters in sleeping areas and ensure proper training and service
  - turn heaters off when not needed (during sleep)
  - if heater kept on during sleep, post a fire guard
  - never sleep in vehicle with engine running
  - never wrap poncho around vehicle exhaust to collect heat

# Snow Blindness

- Inflammation and sensitivity of the eyes caused by ultraviolet rays of the sun reflected by the snow or ice

- Symptoms
  - gritty feeling in eyes
  - redness and tearing
  - eye movement will cause pain
  - headache

# Snow Blindness

- Treatment
  - remove from sunlight
  - blindfold both eyes or cover with cool, wet bandages
  - seek medical attention
  - recovery may take 2-3 days
- Prevention
  - eye protection
    - dark, UV protective glasses
    - field expedient-cut narrow slits in MRE cardboard and tie around head
  - do not wait for discomfort to begin

# Sunburn

- Burning of the skin due to overexposure to the sun and UV light
  - Contributing factors
    - fair skin, light hair
    - exposed skin
    - reflective qualities of the snow
    - high altitudes

- Symptoms
  - redness of skin, slight swelling (1st deg)
  - prolonged exposure (2nd deg)
    - pain and blistering
    - chills, fever, headache

# Sunburn

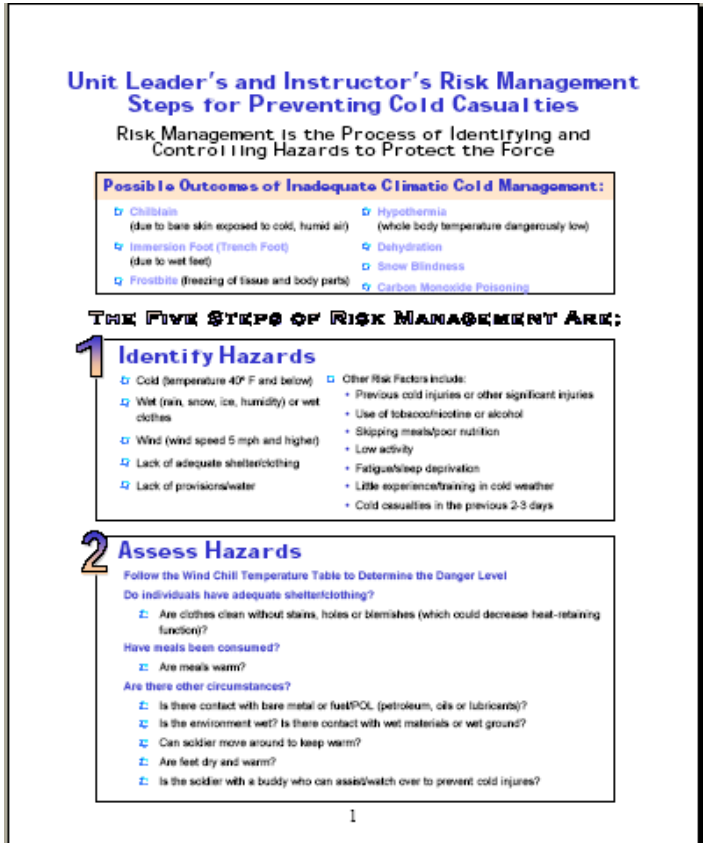
- Treatment
  - soothing skin creams in mild cases
  - in severe cases, seek medical attention
  - ibuprofen for pain
- Prevention
  - cover exposed skin with clothing
  - sunscreen, lip balm
  - limit exposure of skin to the environment

# Cold Injury Prevention

## Risk Management:

- Identify the hazards
- Assess the hazards
- Develop controls
- Implement controls
- Supervise and evaluate

- For detailed Cold Weather Risk Management Guide see http://usachppm.apgea.army.mil/coldinjury



**Unit Leader's and Instructor's Risk Management Steps for Preventing Cold Casualties**

Risk Management is the Process of Identifying and Controlling Hazards to Protect the Force

**Possible Outcomes of Inadequate Climatic Cold Management:**

- Chilblain (due to bare skin exposed to cold, humid air)
- Immersion Foot (Trench Foot) (due to wet feet)
- Frostbite (freezing of tissue and body parts)
- Hypothermia (whole body temperature dangerously low)
- Dehydration
- Snow Blindness
- Carbon Monoxide Poisoning

**THE FIVE STEPS OF RISK MANAGEMENT ARE:**

**1 Identify Hazards**

- Cold (temperature 40° F and below)
- Wet (rain, snow, ice, humidity) or wet clothes
- Wind (wind speed 5 mph and higher)
- Lack of adequate shelter/clothing
- Lack of provisions/water
- Other Risk Factors include:
  - Previous cold injuries or other significant injuries
  - Use of tobacco/nicotine or alcohol
  - Skipping meals/poor nutrition
  - Low activity
  - Fatigue/sleep deprivation
  - Little experience/training in cold weather
  - Cold casualties in the previous 2-3 days

**2 Assess Hazards**

Follow the Wind Chill Temperature Table to Determine the Danger Level

Do individuals have adequate shelter/clothing?

- Are clothes clean without stains, holes or blemishes (which could decrease heat-retaining function)?

Have meals been consumed?

- Are meals warm?

Are there other circumstances?

- Is there contact with bare metal or fuel/POL (petroleum, oils or lubricants)?
- Is the environment wet? Is there contact with wet materials or wet ground?
- Can soldier move around to keep warm?
- Are feet dry and warm?
- Is the soldier with a buddy who can assist/watch over to prevent cold injures?

1

# Cold Injury Prevention

- Identify Hazard
  - Cold (temperature 40°F and below)
  - Wet (rain, snow, ice, humidity) or wet clothes
  - Wind (wind speed 5 miles per hour and higher)
  - Lack of adequate shelter/clothes
  - Lack of provisions/water

# Cold Injury Prevention

- Assess Hazards
  - Be familiar with environmental conditions and the wind chill temperature table
  - Do individuals have adequate shelter/clothing
  - Have meals been consumed? Are meals warm?

# Cold Injury Prevention

- Assess Hazards (continued)
  - Contact with wet materials or wet ground?
  - Can soldiers move around to keep warm?
  - Are feet dry and warm?
  - Is the soldier with a buddy who can assist/watch over to prevent cold casualties?

# Wind Chill Temperature Table

| Wind Speed (mph) ↓ | Air Temperature (°F) | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 | -45 |
| 0 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 | -5 | -10 | -15 | -20 | -25 | -30 | -35 | -40 | -45 |
| 5 | 36 | 31 | 25 | 19 | 13 | 7 | 1 | -5 | -11 | -16 | -22 | -28 | -34 | -40 | -46 | -52 | -57 | -63 |
| 10 | 34 | 27 | 21 | 15 | 9 | 3 | -4 | -10 | -16 | -22 | -28 | -35 | -41 | -47 | -53 | -59 | -66 | -72 |
| 15 | 32 | 25 | 19 | 13 | 6 | 0 | -7 | -13 | -19 | -26 | -32 | -39 | -45 | -51 | -58 | -64 | -71 | -77 |
| 20 | 30 | 24 | 17 | 11 | 4 | -2 | -9 | -15 | -22 | -29 | -35 | -42 | -48 | -55 | -61 | -68 | -74 | -81 |
| 25 | 29 | 23 | 16 | 9 | 3 | -4 | -11 | 25 | -24 | -31 | -37 | -44 | -51 | -58 | -64 | -71 | -78 | -84 |
| 30 | 28 | 22 | 15 | 8 | 1 | -5 | -12 | -19 | -26 | -33 | -39 | -46 | -53 | -60 | -67 | -73 | -80 | -87 |
| 35 | 28 | 21 | 14 | 7 | 0 | -7 | -14 | -21 | -27 | -34 | -41 | -48 | -55 | -62 | -69 | -76 | -82 | -89 |
| 40 | 27 | 20 | 13 | 6 | -1 | -8 | -15 | -22 | -29 | -36 | -43 | -50 | -57 | -64 | -71 | -78 | -84 | -91 |
| 45 | 26 | 19 | 12 | 5 | -2 | -9 | -16 | -23 | -30 | -37 | -44 | -51 | -58 | -65 | -72 | -79 | -86 | -93 |
| 50 | 26 | 19 | 12 | 4 | -3 | -10 | -17 | -24 | -31 | -38 | -45 | -52 | -60 | -67 | -74 | -81 | -88 | -95 |
| | | | | LITTLE DANGER | | | | INCREASED DANGER | | | | | | GREAT DANGER | | | | |

RISK OF FROSTBITE (see times on chart below)

| | |
|---|---|
| GREEN | LITTLE DANGER (frostbite occurs in >2 hours in dry, exposed skin) |
| YELLOW | INCREASED DANGER (frostbite could occur in 45 minutes or less in dry, exposed skin) |
| RED | GREAT DANGER (frostbite could occur in 5 minutes or less in dry, exposed skin) |

# Wind Chill Temperature Table Guidance

**Wind Chill Category**

| Work Intensity | Little Danger | Increased Danger | Great Danger |
|---|---|---|---|
| **High**<br><br>**Digging foxhole, running, marching with rucksack, making or breaking bivouac** | Increased surveillance by small unit leaders; Black gloves optional - mandatory below 0ºF (-18ºC); | ECWCS or equivalent; Mittens with liners; No facial camouflage; Exposed skin covered and kept dry; Rest in warm, sheltered area; Vapor barrier boots below 0ºF (-18ºC) Provide warming facilities | Postpone non-essential training; Essential tasks only with <15 minute exposure; Work groups of no less than 2; Cover all exposed skin, Provide warming facilities |
| **Low**<br><br>**Walking, marching without rucksack, drill and ceremony** | Increased surveillance; Cover exposed flesh when possible; Mittens with liner and no facial camouflage below 10ºF (-12ºC); Full head cover below 0ºF (-18ºC). Keep skin dry - especially around nose and mouth. | Restrict Non-essential training; 30-40 minute work cycles with frequent supervisory surveillance for essential tasks. See above. | Cancel Outdoor Training |
| **Sedentary**<br><br>**Sentry duty, eating, resting, sleeping, clerical work** | See above; Full head cover and no facial camouflage below 10ºF (-12ºC); Cold-weather boots (VB) below 0ºF (-18ºC); Shorten duty cycles; Provide warming facilities | Postpone non-essential training; 15-20 minute work cycles for essential tasks; Work groups of no less than 2 personnel; No exposed skin | Cancel Outdoor Training |

**These guidelines are generalized for worldwide use. Commanders of units with extensive extreme cold-weather training and specialized equipment may opt to use less conservative guidelines.**

Source: USARIEM Technical Note "SUSTAINING HEALTH & PERFORMANCE IN COLD WEATHER OPERATIONS," October 2001

# Cold Injury Prevention

- Develop Controls
  - Educate soldiers of hazards and controls
  - Provide properly fitting clothing and footgear for cold weather
  - Provide adequate nutrition & hydration

# Cold Injury Prevention

- Develop Controls (Cont.)
  - Schedule training to fit weather conditions
  - Keep moving to exercise big muscles
  - Protect feet, hands, face, ears, and eyes
  - Prevent carbon monoxide poisoning

# Cold Injury Prevention

- Implement Controls
  - Identified controls are integrated into SOPs
  - Use buddy system to check clothes and personal protection
  - Discontinue or limit activities/exercise during extreme cold weather

# Cold Injury Prevention

- Implement Controls (Cont.)
  - Have warming tents available (with fire guards)
  - Have warm food and drink on hand
  - Use only Army authorized heaters and ensure integrity of shelters, for maximum protection

# Cold Injury Prevention

- Supervise & Evaluate
  - Monitor adequacy/progress of implementation of control measures
  - Do spot checks of clothes and personal protection
  - Evaluate current control measures and strategize new/more efficient ways to keep warm and avoid cold injuries

# Cold Injury Prevention

**“C.O.L.D.”**

- C: Clean clothes
- O: Avoid Overheating
- L:  Use Loose clothing in layers
- D:  Keep it Dry

# Conclusion

- Dress properly
- Drink plenty of fluids
- Eat right
- Don’t Smoke or drink Alcohol
- Keep in shape
- Get plenty of rest
- Minimize periods of inactivity
- Maintain a positive attitude
- Use heaters correctly
- Buddy System

# Reference Materials

- Technical Note 02-2 *Sustaining Health and Performance In Cold Weather Operations*, US Army Research Institute of Environmental Medicine (USARIEM) *(October 2001)*
- TC 21-3 *Soldier's Handbook for Individual Operations and Survival in Cold-Weather Areas*
- FM 31-70 *Basic Cold Weather Manual*
- FM 21-10 *Field Hygiene and Sanitation*
- FM 21-11 *First Aid for Soldiers*
- Technical Note 93-4 *Medical Aspects of Cold Weather Operations: A Handbook for Medical Officers*, USARIEM
- TRADOC Regulation 350-29 (Prevention of Heat and Cold Casualties), July 2003
- TB Med 507 (Heat Stress Control and Heat Casualty Management), March 2003
- http://usachppm.apgea.army.mil/coldinjury/

# QUESTIONS?